UNITED STATES PATENT AND TRADEMARK OFFICE

A

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,532	10/02/2001	Jiro Yamada	09794353-001	4317

7590 12/28/2005

David R Metzger
Sonnenschein Nath & Rosenthal
Wacker Drive Station
PO Box 061080
Chicago, IL 60606-1080

EXAMINER	
HODGES, MATTHEW P	

ART UNIT	PAPER NUMBER
2879	

DATE MAILED: 12/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/889,532	YAMADA ET AL.	
	Examiner	Art Unit	
	Matt P. Hodges	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *38-44 and 49-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *39,41-44,51 and 52* is/are allowed.

6)☒ Claim(s) *38,40,49,50 and 53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The Amendment, filed on 9/16/2005, has been entered and acknowledged by the Examiner.

Cancellation of claims 45 has been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 38 and 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Isaka et al. (US 5,936,347).

Regarding claims 38 and 49, Isaka discloses (see figure 1) a display device including a light-emitting layer (12), between a first electrode (10) of reflective material, and a second electrode (6) of transparent material. The resonant cavity is formed between the first electrode and the semi-reflective mirror (5). (Column 6 lines 37-65). Further the width of the light emitting layer is set according to the equation on Column 5 line 44, which establishes the width to be any integer value that satisfies resonance for the desired color emission. Any integer value here includes a minimum integer value which would include the positive minimum value. A

width of the resonant cavity slightly below a cavity at resonance with the internal spectrum would lead to an external spectrum being slightly below the wavelength of the internal spectrum, while a value of the cavity being slightly higher than the peak resonance width would lead to the reverse. Therefor, a value at resonance with the internal spectrum, as disclosed in the prior art above, lies between the first and second values described above.

Claims 40, 49, 50, and 53 are rejected under 35 U.S.C. 102(e) as being anticipated by Xu et al. (US 6,133,692).

Regarding claim 40, Xu discloses (see figure 1) a display device including a light-emitting layer (16), between a first electrode (15) of reflective material, and a second electrode (18) of transparent material. The resonant cavity is formed between the first electrode and the semi-reflective mirror (21) and has an optical length equal to the widths of both the light emitting layer and the second electrode. (Column 2 lines 36-57). The cavity is multi-mode having peaks in the red, green and blue wavelengths. The optical length of the cavity is set to integer values of m being much greater than zero as it is multimode and necessarily requires resonance at all three transmitted regions. Therefor in the applicant's equation the value of Q would be much greater than 10.

Regarding claim 49, A width of the resonant cavity slightly below a cavity at resonance with the internal spectrum would lead to an external spectrum being slightly below the wavelength of the internal spectrum, while a value of the cavity being slightly higher than the peak resonance width would lead to the reverse. Therefor, a value at resonance with the internal

spectrum, as disclosed in the prior art above, lies between the first and second values described above.

Regarding claims 50 and 53, Xu further discloses the use of color filters (13) outside the cavities for transmitting the resonated light. (Column 3 lines 33-44). The color filters are optionally passive, working by absorbing all light outside of the desired light to transmit. At each subsection then, the filter allows only one of a red, blue, or green color to be transmitted. (Column 4 lines 1-10).

Allowable Subject Matter

Claim 39, 41- 44, 51 and 52 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 39, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 39, and specifically comprising the limitation of a display device where the optical path length is increased until exactly 4 more resonances for green light are included beyond the lowest positive minimum value of the optical path length, during resonance of the that green light.

Regarding claim 41, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 41, and specifically comprising the limitation of a display device where reflectance of every wavelength of external light is less than 30%

Regarding claims 42-44, claims 42-44 are allowable for the reasons given in claim 41 because of their dependency status from claim 41.

Regarding claim 51, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 51, and specifically comprising the limitation of a display device where the optical path length is increased until exactly 4 more resonances for green light are included beyond the lowest positive minimum value of the optical path length, during resonance of the that green light.

Regarding claim 52, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 52, and specifically comprising the limitation of a display device where the optical path length is increased until at least 10 more resonances for green light are included beyond the lowest positive minimum value of the optical path length, during resonance of the that green light and where the cavity is formed between the interface between the semi-reflective layer and second electrode and the upper edge of the passivation film.

Response to Arguments

Regarding applicants assertion that the prior art of record does not disclose the use of an optical path length including the phase change of the interfaces of the surfaces of the cavity, the examiner respectfully disagrees. The prior art of record discloses a formula that is simplified by removing the phase change values and specifying the wavelengths that lead to resonant values. However, in order to reach resonant values, the subsequent wavelengths must also take into account the phase change (which is a fixed property of the materials used). Thus the prior art stated must additional consider phase change in order to lead to the desired resonant cavities. Therefor, that the resonant occurs is proof that the phase change at the various interfaces has

been considered by the prior art. That the phase change is not explicitly stated in the prior art does not in the examiner's opinion disregard the requirement in the technology for the prior art to account for the phase change values.

Regarding applicant's assertion that the multimode cavity disclosed by Xu does not anticipate the optical path lengths claimed, the examiner respectfully disagrees. While the limited claim of "m1 + 4" (see claim 39) has been allowed the much broader claim limitation of "m1+q" (see claim 40) is not. The latter limitation is anticipated by the multimode device of Xu, where it is advantageous to increase the cavity length to find resonant peaks for all three of red, blue and green lines. It is seen through calculation that the device as disclosed by Xu, would require a cavity of much greater than the minimum resonant value of a green light cavity in order to provide resonant peaks for all of the three wavelengths at the same time.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matt P Hodges whose telephone number is (571) 272-2454. The examiner can normally be reached on 7:30 AM to 4:00 PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

mph

JOSEPH WILLIAMS
PRIMARY EXAMINER